GrummanWorld

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After Spring Break, X-29 Resumes Flight Tests

On Tuesday, June 10, the X-29 advanced technology demonstrator resumed its test flights after a three-month hiatus.

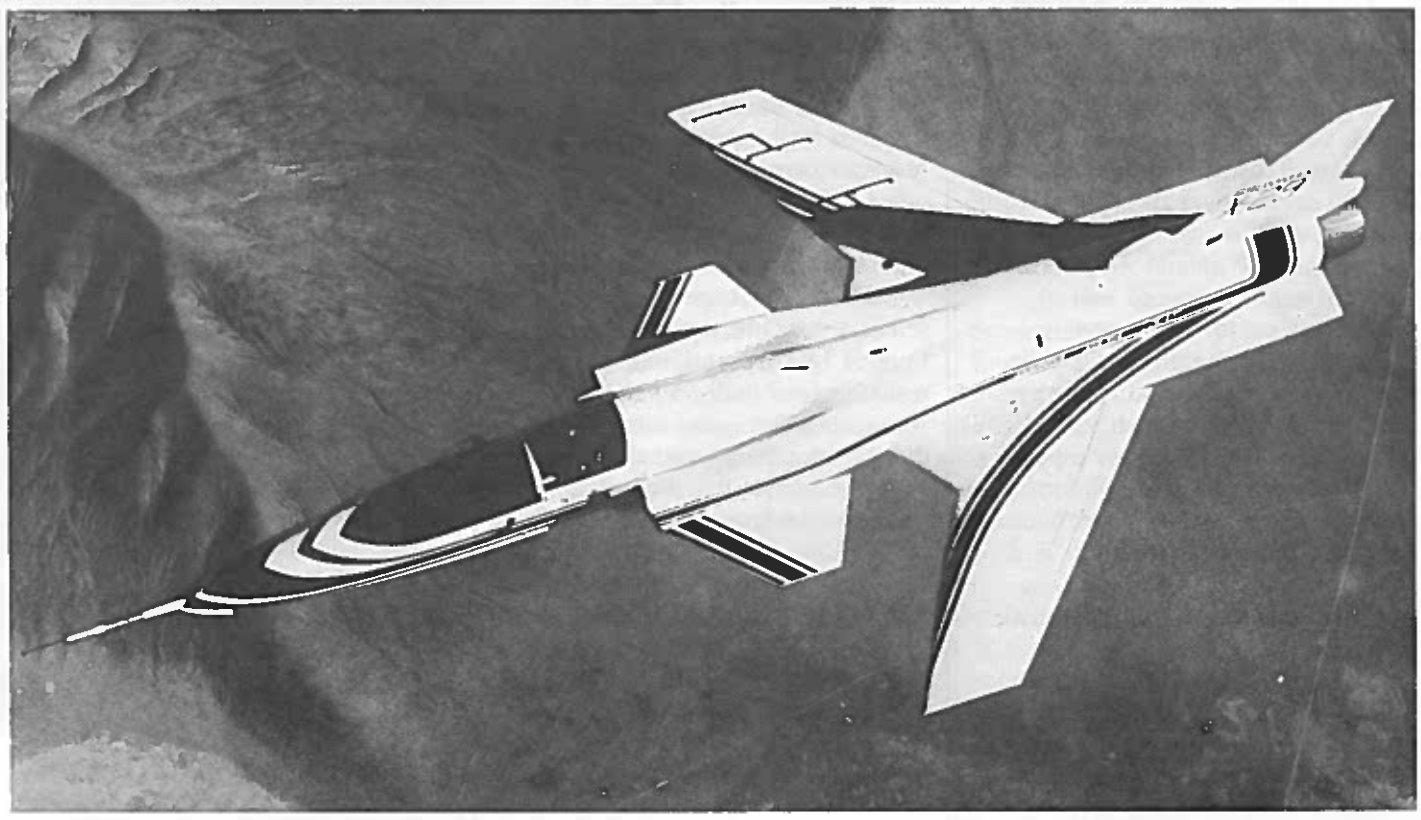
It went back on a very busy schedule. On June 10, Grumman test pilot Kurt Schroeder flew the aircraft for just over one hour at Edwards Air Force Base, California. On Thursday, June 12, there were four more flights — two by NASA pilots Steve Ishmael, and one each by NASA's Rogers Smith and Air Force pilot Ted Wierzbanowski.

These tests are part of a continuing effort to expand the X-29's flight envelope. "The X-29 has about 60 flights to finish," says John Calandra, X-29 program director. "Assuming all goes as planned, and the X-29 flies three times a week, it will wrap up the envelope expansion program in five months."

Among the remaining tests are both high and low speed flights, and combinations of those. One new method that's being tried is to schedule multiple flights on the same day. "That way, we can rely on the same weather conditions, and take advantage of the aircraft being in a ready status," says Calandra.

Grumman still has a team of 25 people at Edwards to help monitor test flights, do post-flight analysis, and prepare for subsequent flights. They're supported by a dozen or so engineers in Bethpage and Calverton.

The envelope expansion program has proceeded much as predicted with no technical problems or surprises, says Calandra. "When we look at the data from the actual flights, it correlates very closely with our flight predictions," he notes.



Back On Track. *At Edwards Air Force Base, California, the X-29 recently began flying again after a three-month break. It had been grounded for routine inspection and maintenance.*

The X-29 had been grounded for detailed maintenance and inspection. This was a routine procedure, set for when the plane had racked up 50 hours. The next scheduled maintenance is at 75 hours.

Meanwhile, the second X-29 is being proposed for high-angle-of-attack flight tests. Aircraft No. 2 was originally built as a backup, but the Air Force is supporting a "high alpha" program.

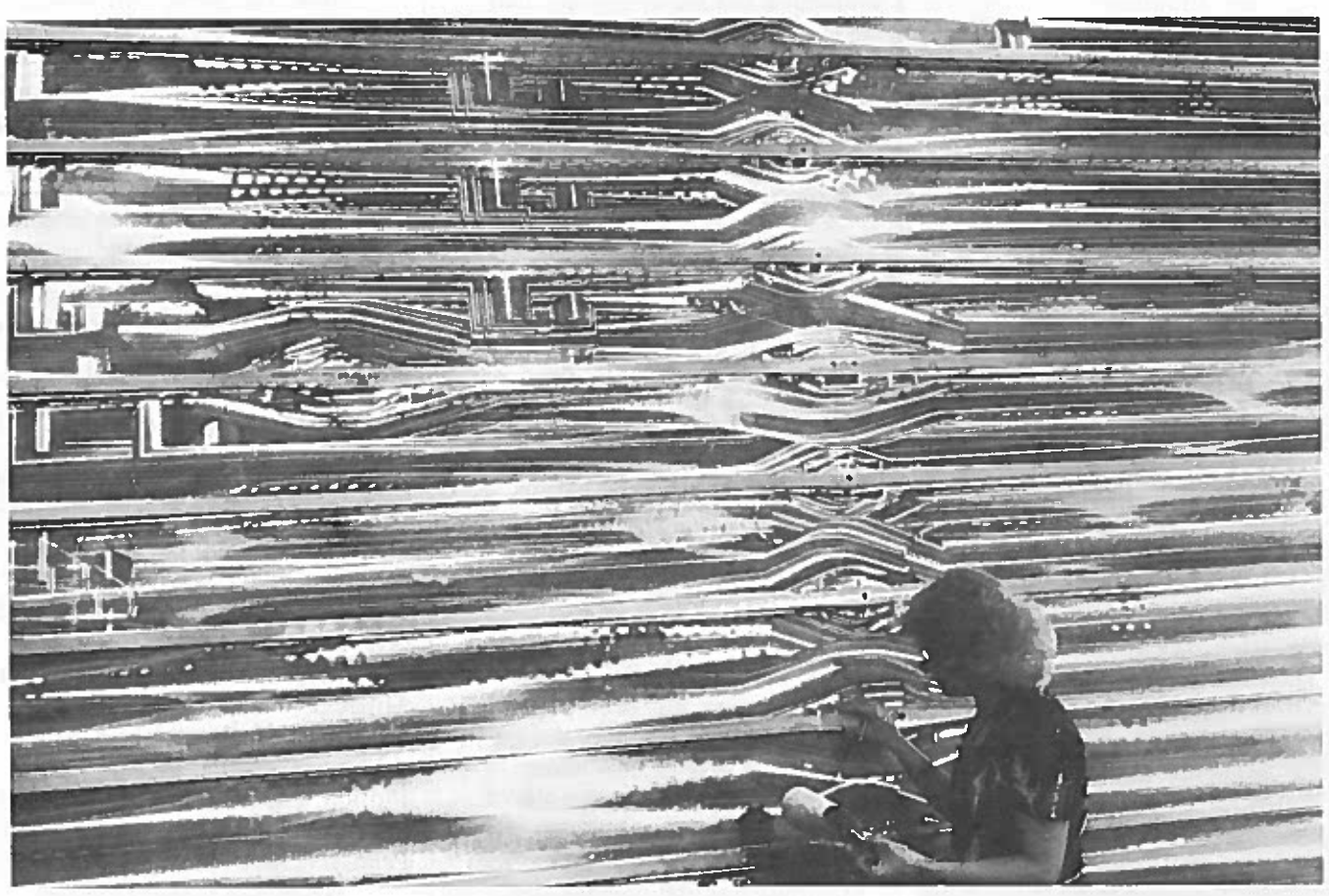
The X-29 is currently limited to 20 degrees angle-of-attack. However, by installing a spin chute — a parachute apparatus that can be activated to recover from a possible spin, the airplane can attain very high angles of attack up to 90 degrees.

In support of the second plane's flight test program, wind-tunnel tests were done at Arnold Engineering Development Center to gain additional aerodynamic data. The data forms the basis for the X-29's flight control laws. It is also used in flight simulation exercises and by Grumman's Aerotest department for aerodynamic research.

The tests provided data from Mach .6 through .9, at angles of attack ranging from -4 through 40 degrees. "Up until then, we only had the high-angle-of-attack data for low speeds," says Mike Moore, a project engineer on the X-29 program.

The ground tests will also save flight time and costs. Without the wind tunnel data, pilots would need to make an additional 10 test flights at an estimated cost of $500,000.

The high alpha program schedule is currently being discussed with the Air Force. Tentatively, the design effort would start in August of this year, while flight testing would take place in 1988. ■



Brilliant Work. *Glen Arm Quality Control inspector Linda Lester checks a machined Space Shuttle external tank skin. Grumman's Machining Operations facility in Maryland gets the 11x12-foot aluminum skins from Martin Marietta. The air passage side is already finished. Grummanites machine the inside surface to its final finish. That includes undercutting T-ribs, one of which Lester is inspecting. Grumman returns the flat skins to Martin to be welded together. It takes 32 skins to make an external tank. Glen Arm machines 16 of them. (Photo by Rich Breunig)*

What's Inside

Automated Telemetry System Hones Its Sleuthing Power - Pg. 3

Soup To Nuts - Grumman Keeps Airline Supplier System Clicking - Pg. 4

'86 Scholars Join The Grumman Family - Pg. 5

First Manhattan Named Equity Fund Manager

First Manhattan Co., Incorporated, has been named the new manager of the Employee Investment Plan's Equity Fund. The Grumman Board of Directors approved the selection on June 19.

On or about July 1, First Manhattan will take over the management of the Equity Fund, which was formerly handled by Fiduciary Trust Company. Fiduciary remains as manager of the Fixed Income Fund.

At the EIP annual meeting in April, it was announced that a search was on to find a new manager of the Equity Fund. The Equity Fund had posted a 25 percent return on investment in 1985. "However, it should have outperformed the other three EIP funds by an even wider margin," says Vice President and Secretary Bob Bradshaw.

In recent years, the Equity Fund was outperformed by Standard and Poors 500 Index, Dow Jones Industrial averages and the SEI Median for equity funds. SEI is an advisory firm that produces a comparative listing of equity and fixed-income funds.

Fiduciary has managed the Equity Fund for the past 11 years. It performed well in the first five or six years. "But during the past five years their performance declined," says Bradshaw.

The main goal of the Equity Fund is to preserve the assets of the fund in a declining market. "We are willing to sacrifice some gains in a rising market to outperform the market in a period of decline," says Bradshaw. For instance, if you invested $1 and the market slumped and your investment dropped to 50 cents, you would have to register a 100 percent return on your 50 cents to bring it back up to $1.

"EIP was established as a long-term investment plan for Grummanites," says Bradshaw. "After carefully analyzing Fiduciary's management of the Equity Fund, we decided to select a new fund manager."

Assisting the EIP Committee in the search were Bill Parmentier, Grumman Corporation assistant treasurer and director of Investment Management; and Harry Turner, director of Economic Analysis.

This group first had to review whether to continue with an investment manager or to turn the Equity Fund into an indexed fund. With this type of fund, the portfolio is designed to mirror common indexes such as the Standard and Poors.

In a bull market, an indexed fund performs admirably. "On the other hand, in a declining market, your fund would be the first to plummet in value," says Bradshaw.

The EIP committee elected to select a new investment manager. Funded by corporate money, a research firm called Evaluation Associates, Inc., was hired to study the top investment managers. Six were recommended. First Manhattan was selected from the three finalists.

According to Bradshaw, all six firms' rate of return was higher than the Standard and Poors and other indexes. First Manhattan was chosen because of its trend of investing in quality, stable, growth companies with little risk of declining in value. "First Manhattan looks at stable companies with underlying qualities such as financial security, growth potential, good product lines, and a superior management," says Bradshaw.

While other companies might quickly convert their investments into cash at the slightest dip in the economy, First Manhattan is more conservative. It is more likely to stay in the market and convert a minimum of stocks to cash.

"First Manhattan has demonstated over a long period of time, its ability to achieve the EIP principal objective - preserve the fund's assets while posting a steady gain," says Bradshaw.

Bankers Trust Company has been named directed trustee to handle custody of the Equity Fund's securities and certain other administrative functions. ■

Unit Values

The Grumman Employee Investment Plan has reported the following unit values as of April 30 (compared to March 31 figures):

Equity Fund
3.621 down from 3.672

Fixed Income Fund
5.393 up from 5.35

Guaranteed Income Fund
2.24 up from 2.22

Company Stock Fund
$28.313 up from +27.19

Up With The Big Boys. *Grumman's Robotic Ranger quietly sneaks up on a tank during the recent demolition mission trials at Fort Benning, Georgia. (Photo by Harry Prodromides)*

Robotic Ranger Scores Big Hit In Army Test

The Electronics Systems Division's tough little Robotic Ranger recently had its trial by fire.

The remotely-controlled, three-foot high friend to the infantryman finished a formal Army Concept Evaluation Program at Fort Benning, Georgia, on June 19. For five weeks the Robotic Ranger fired anti-armor missiles and machine guns, and went on reconnaissance and demolition missions.

Jerry Kirsch, Guided Weapons Systems Products director for Robotic Vehicles, was delighted with the Ranger's performance. "On a scale of one to 10, it's a 9.5," says Kirsch. "And that's not my personal evaluation but the comments that we've been getting from the Army."

The Ranger was operated routinely by four soldiers during the trials. They maneuvered the Ranger and fired its weapons from a suitcase-sized control unit. Their commands traveled to the Ranger, and video images of what the Ranger "saw" were transmitted, via a multi-kilometer fiber optic link, to a monitor on the control unit.

The soldiers got so good at operating the Ranger, says Kirsch, that "during the anti-armor missile-firing tests they stopped aiming for the tank and aimed for specific locations on the tank instead."

The test, held under a contract with the Tank Automotive Command, was run by the Army's Infantry Board. Grumman is now awaiting the Army's formal evaluation.

Soon, the Army will issue a Request For Proposal that will lead to a Tele-operated Mobile Anti-armor Project contract. Preproduction contracts could be awarded in early 1988.■

Composite Bird Leaves Designers' Nest

Aerostructures gets order to build nine tail sections for V-22 Tilt Rotors

Next month, Grumman will start making nine tail sections — called empennages — for the V-22 Osprey Tilt Rotor aircraft.

Grumman Aerostructures is a subcontractor to the Boeing Vertol Company, which is teamed with Bell Helicopter. The Bell/Boeing Tilt Rotor team developed the V-22. It will be the largest all-composite production aircraft, and the first tilt rotor production aircraft in the world.

The engine and 38-foot rotor at each wing tip can tilt back to lift the V-22 vertically, like a helicopter. Then, the pilot can tilt the two rotors forward and dash off at speeds over 300 m.p.h.

Current plans call for an anticipated total of 1,315 V-22s for the Air Force, Army, Marines, and Navy. The Naval Air Systems Command is managing the program.

The Bell/Boeing team recently received a $1.7 billion fixed-price incentive award for the seven-year full-scale development program. Aerostructures has been performing engineering and tool design in Melville, Long Island, while awaiting the formal full-scale development contract.

Aerostructures President Tom McGrath says the empennage designers have maximized the advantages of composite materials.

"This is a complex composite structure that provides the required strength with minimum weight," says McGrath. Composites are non-metallic fibers impregnated with an epoxy resin, shaped to a molded form, and cured in an autoclave under heat and pressure.

According to Bill Brown, V-22 program manager, Grumman's composite manufacturing facility in Milledgeville, Georgia, will make the parts. The empennages will then be assembled in Stuart, Florida, and delivered to Boeing Vertol in Philadelphia, Pennsylvania.

"Grumman will deliver the first empennage next spring," says Brown. "The first flight of a V-22 is planned for June, 1988."

Showing Our Stuff. *John Diglio, Space-Based Radar program director, shows Lt. Gen. James Abrahamson models of Space Systems-developed Strategic Defense Initiative designs. Division President Alex Alexandrovich (L) and Bob Pirrung (R), vice president, Resources, escorted the general on his tour of Grumman areas dedicated to SDI work. (Photo by Rich Breunig)*

Top SDI Official Visits Grumman

Lt. Gen. James Abrahamson, the director of the Strategic Defense Initiative for the Department of Defense, visited Grumman late last month.

The general met with Grumman Chairman Jack Bierwirth and Alex Alexandrovich, the president of Grumman's Space Systems Division and director of SDI programs. Alexandrovich took Abrahamson on a half-day tour of several sites in the Bethpage complex that house Grumman's SDI work.

Abrahamson saw the hardware technology, such as mosaic detector focal plane technology, deployable antenna technology and models of candidate Shuttle flight experiments, that Grumman has developed under three major SDI contracts: Nuclear Particle Beam, the Boost Surveillance Tracking System and Space-Based Radar. Together they represent about $50 million in business for the company.

After his Grumman visit Abrahamson addressed the "Hap" Arnold chapter of the Air Force Association at the Milleridge Cottage in Jericho, L.I.

Automated Telemetry Station Hones Its Sleuthing Skills

When Grumman aircraft are test flown over Calverton, Long Island, they are tracked by electronic gumshoes — the sophisticated array of sensors and computers known as the Automated Telemetry System (ATS).

Just recently, the system's ability to monitor a plane's every move was sharpened: its telemetry processing systems and control and analysis computers have been replaced. This completes the first part of a $30 million upgrade project.

"Essentially, the core computer system of the ATS is complete," says Tom Kastner, manager—ATS for Grumman Aircraft Systems. "But the second part of the ATS upgrade won't be finished until May or June of next year. It's being set up to handle the specific requirements of the F-14D and the A-6F flight test programs, which will begin next summer, and the EA-6B Advanced Capabilities aircraft, coming along in 1989."

Two big mainframe computers are being replaced by over 70 new mini- and microcomputers, more than doubling the ATS' computing power. These computers also have fewer maintenance problems and can be rearranged more easily than their aging predecessors.

Additionally, by design, the system can now handle classified and unclassified test flights at the same time. Data from the former is merely routed to a separate group of minicomputers. Previously, when a classified test flight was under way, an unclassified flight had to wait.

The new computer system will first be used for test flights of the F-14A+, set for August. "We're pretty much on track with the upgrading of the system," says Kastner. "We have a busy schedule of flight tests coming up, so we don't have much latitude."

At press time, the ATS group had just finished technical acceptance tests for the new computer network. Operational evaluations were about to begin.

Kastner draws an analogy between his crew's testing of the new system and the kinds of test flights a jet fighter will take. "In acceptance tests, you fly the plane to make sure it can do everything that specifications say it can," says Kastner. "For example, pull so many Gs, climb at a particular rate, carry certain armaments. Then come the operational test flights in which the plane practices intercepts and other missions.

"In our acceptance tests, we determined that the computer system functioned according to the performance specs. Next, we'll turn it over to the users, who will see how it handles real-life flight scenarios."

Yet another new piece of hardware at the Automated Telemetry System is its $1 million uninterruptible power supply, which is being installed by Facilities Engineering. This was necessary due to the sheer volume of computing there and the questionable electrical service in the area.

"Without an uninterruptible power supply, you have too many problems on this end of the island," he says. He explains that computers demand "pure," uninterrupted power, and the way electricity is distributed in the rural East End, customers are too often subject to fluctuations and brownouts.

Soon to arrive at the Flight Test Center will be the first of about 50 Navy representatives. Normally, Grumman test flies an aircraft at Calverton, then turns it over to the Navy for its own tests at Patuxent River, Maryland, or other bases.

Starting with the F-14A+, more of that will be done at Calverton. By the time the F-14D and A-6F flight tests get under way, all of the test flights will be handled or managed from there.■

Sky-watching Snoop. *Data analysis station operator Tim Melly and test conductor Brian Beatty monitor a test flight using Calverton's Automated Telemetry System, which is in the middle of a $30-million upgrade. (Photo by Gerry Costello)*

Personals

My family and I want to take this opportunity to thank all our Grumman friends for their kind expressions of sympathy on the loss of my mother and father. Your thoughtfulness helped ease the pain. **Al Gurkewitz and Family**

My family and I wish to express our most sincere appreciation for the final respects you paid to "Mr. J". Your overwhelming response in our time of need was a sincere gesture of understanding and friendship. We feel so very fortunate to have made such good friends over the years. **Ray Sentz and Family**

We wish to thank our co-workers and ESO for their concern and kind words of sympathy during the recent loss of my mother. **Al Kaplan and Family**

Much thanks to all for their good wishes on my retirement. **Vivian Agnoli**

I would like to express my thanks to all my friends at Grumman for their kind expressions of sympathy during the recent loss of my brother and of my mother. **Fabio Angeli**

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Let Us Know

We don't want to do all the talking.

We'd like to know what you think about the things you see in these pages, and what you see going on in the company. Serious comments, questions and complaints are welcomed, and will be answered by people most qualified to respond.

Letters to the editor should be addressed to *Grumman World*, 1111 Stewart Avenue, A27-GHQ, Bethpage, N.Y. 11714, and should include your name and address.

Soup To Nuts: Grumman Keeps Computers Clicking Away At Chicago Airline Supplier

DES PLAINES, Illinois — In the area near Chicago's O'Hare Airport, the breakdown of one minicomputer could cause a lot of heartburn.

Food freezers might not get filled. On down the line, airline cooks might run out of microwave-able plates and plastic wrap. A 727 could be delayed at the gate, waiting for paper towels for its lavatories. The harried passenger, who had hoped to beat the 6 p.m. rush hour, ends up counting the planes on the runway.

To the people at Sage Foods, Inc., that's the script of a nightmare. And to head off such problems, it relies on Grumman System Support's Chicago office.

Sage distributes, to airline caterers, everything from plastic cups to cheese, frozen entrees to peanuts. Its headquarters are a few miles from O'Hare, which, at 49,954,362 passengers in 1985, is the world's busiest airport. Besides that, Sage has warehouses in nearby Bensenville, Illinois, Los Angeles, Denver, Dallas-Fort Worth, Miami, and New York.

"We're very dependent on our computer," says Kirk Honold, Sage's director of Management Information Systems. "We can never tell a caterer, 'we don't have the product you need in stock' just as the caterer can't tell the airlines, 'we can't board any meals today.' We have to supply it, and fast. The computer helps us do that, by providing an on-line, up-to-the-minute inventory."

The branches have terminals connected by telephone to headquarters. "During the day, the computer is used mainly for order entry," Honold explains. "At night, our inventory and warehouse people rely on it to keep track of quantities. If the computer breaks down in the middle of the night, we can't wait until the morning to get it fixed."

'Quick response keeps the customer happy'

Breakdowns were too frequent several years ago. Sage then relied on the manufacturer of the computer for preventive maintenance and service calls.

"The manufacturer was not living up to its part of the deal," says Honold. "Preventive maintenance wasn't being done at all. Every Tuesday, we'd wait for the rep to show up. As the day wore on, we'd call his office, and they'd tell us, 'he's in class all week' or 'he's on vacation'."

Honold investigated other area service firms, and then called Computer Systems Support Corporation (CSSC), the Maryland-based firm acquired by Grumman in 1984.

Honold gambled and signed them to a service contract — and he's been happy ever since.

"It's a relief, not having to explain to management why the computers are down," says Honold. "The Grumman reps aren't board swappers — I can do that myself! They get to the source of the problem, and they fix it fast."

And they really do their homework. Here's an example. When power fluctuated, Sage's four powerful disk drives used to restart, and the power drain would cause the entire system to crash.

These fluctuations occur several times a week, due to the quirky construction of the office building. Larry Schwartz, coordinator of National Technical Support for Grumman, advised Sage to replace its disk drives with newer, faster, less power-hungry models. A vexing problem was solved.

'We haven't lost a single customer'

The Chicago office works on Data General and DEC computers and IBM PCs. Also, just a few months ago, Kim McElhinney joined the office from Arrow Electronics, adding a new skill: TeleVideo equipment.

When called, any of the 10 field maintenance engineers will rush to the scene of a breakdown — even through legendary Chicago snowstorms and traffic tie-ups.

"We average one to one-and-a-half hours response time," says Vito Cristino, Chicago branch manager. On a sign behind his desk is the word "downtime" with a slash through it. "Quick response keeps customers happy."

Night and weekend calls are few and far between, but they do happen. The staff takes turns wearing a pager after hours. Nobody gets stuck with it two weekends in a row — except Schwartz, who uses a computerized, intelligent paging system in case a field engineer needs assistance.

"Normally it's got to be a major problem if a customer pages you," he adds. "If it's something like a printer problem, they'll wait till the next day to get it fixed."

Most critical preventive maintenance calls are also done after hours or on Saturdays — when the computer users have all gone home and won't be disrupted by a service call.

"If the computer memory is failing, it might not show up as a problem if a customer doesn't use the entire memory," says Cristino. "Preventive maintenance helps you catch problems before they become major catastrophes."

Such dedication pays off when contracts are up for renewal. "We haven't lost a single customer due to dissatisfaction, though a few have installed equipment that we don't service," says Cristino.

Besides Sage, Grumman Systems Support's Chicago office services about 65 customers in Chicago, its sprawling suburbs, southern Wisconsin, and northern Indiana. The largest is the Northern Trust Bank in downtown Chicago.

"If you can go in and fix an ongoing problem right away, well, you've got a customer," he adds. Once, Cristino and Schwartz went to Bloomer and Fiske, an engineering firm. The firm was experiencing an ongoing problem with its central processing unit, the two men demonstrated a solution, and Grumman won the contract.

"When it comes to renewing a contract, the customer looks at the amount of computer downtime, and your service response time," says Cristino. "Getting a service person to the site quickly — the customer remembers that."

"It's good to find a service contractor that you can rely on, and also, keep up with your growth," says Honold. "And Grumman has done that."■

The Inside Story. *Carlos Calit, technical support analyst for Sage Foods, assists in debugging the computer's internal components.*

Equipment Of Many Stripes. *In the shop at Grumman Systems Support's Chicago office, field engineer Ray Schwarz repairs a Zebra disk drive.*

Retirees

On behalf of our fellow workers, *Grumman World* salutes the following Grummanites for their contributions to the company and wishes them well in their retirement. Those who have recently retired are:

Margaret Sanfilippo (35), Giacomo J. Sanfilippo (1), Kenneth Williams (43), Martha L. Nathan (30), Edward L. Nathan (46), Marie Annello (43), Khianii Das (9), John J. Kennedy (110), Walter R. Grochala (2), Walter M. Hoderath (39), John W. Donohue (2), Dana Mihelich (2), Joseph R. Staffieri (12), Alton F. Williams (2), Robert T. McCall (2), Camillo Kemper (6), Lawrence J. Fortier (110), Warren E. Christopher (1), Frank L. Donnelly (112), William E. Simmons (2), John Railton (40), Erasmus D'Agostino (44), John A. Winn (12), John P. Lane (3), Benjamin E. Lindquist Jr., (1), Geraldine I. Marangio (77), Ralph O. Marangio (77), Dorothy Tveter (5), William J. Sheridan (25), William H. Horton (2), Robert H. Willsey (5), Frank D'Anna (25), Nelson R. Bolton Jr. (3), Louis Ferraro (43), Anthony P. Glaser (5), Geraldine M. Miller (1), Catherine E. Lacina (2), Gasper A. Liotta (17), Raymond D. Mahon (110), Frank A. Petro Sr. (30), Frederick F. Schnettler (21), William H. Shaw (Allied), Robert J. Holden (12), Walter W. Blenner (2), James H. Bailey (35), Raymond G. Miller (4), Frank J. Douso (2), Joseph Volpe (2), Murray Beckerman (110), Bernard Monte (12), Leo E. LeRoux (2), Catherine A. McGrath (110), George M. Melzer (24), Vincent Ramundo (12), Bernard Monte (12), Joseph Glemboski (77), Laurence Comodo (6), Dorothy J. Smith (40), John H. Solliday (3), Stanley P. Saluska (2), James W. Bush (40), George T. Greer (25), George D. Warnken (7), Joseph Cange (3), James Aldworth (44), Anthony J. Roberto (2), Gabriel Isakson (35).

'86 Scholars Anxious To Pursue High Tech Careers

The dining room is an unlikely place for learning about engineering, science, or applied mathematics.

But that's where the six 1986 dependent Grumman Science and Engineering Scholarship winners say they learned the most about their chosen careers. Family discussions and their dads' insights influenced their career and college selections.

Since the program's inception 42 years ago, the company has awarded over $3 million to about 500 Grumman scholars. In addition to the six Grumman dependents, this year's recipients include six nondependents. All are from Long Island high schools.

Each student receives $5,500 per year to defray tuition costs at an accredited engineering college. The company also selected four alternates, should a winner decline the scholarship. The winners and the four alternates can work at Grumman for four summers prior to college graduation. After that, they will be offered jobs.

Debora and her father, Aldo Arena

Debora Arena is the daughter of Grummanite Aldo Arena, a design project leader on the Lavi program in Melville, Long Island. She just graduated from Smithtown High School and will major in mechanical engineering at the University of Virginia. Her Grumman advisor is James Karanik, Systems Power Plant Design, Building 5, Bethpage.

"When I was in junior high school, I began to understand and appreciate what my dad's job entailed," Debora recalls.

Her dad is proud that Debora is following in his footsteps. "Debora is mechanically inclined," says Aldo. "As an engineer I know what she's in for and I have confidence that she can endure all the hard work ahead."

She was treasurer of the National Honor Society, a member of the student council, and Students Against Driving Drunk.

Jay and his father, Martin Brunnwasser

Jay Brunnwasser is the son of Martin Brunnwasser, F-14 Electromagnetic Environmental Effects group leader, Bethpage. His Grumman advisor is Kevin Blankenship, Flight Systems Design & Analysis, Building 35, Bethpage.

Jay ranked third in his graduating class at John F. Kennedy High School in Bellmore. He will study applied mathematics at the University of Pennsylvania.

Since he was 13, Jay has been running programs to deter airplane radar systems from crossing. "Dad gives me the data and within minutes I can run out a program for him."

"Jay is an extremely hard worker," says Martin Brunnwasser, a 24-year Grummanite. "And he always excelled in math and science."

Jay was a member of the National Honor Society, and the Medical Explorers Club, and a volunteer for Nassau County Medical Center.

Melissa and her father, Reuben Chow

Melissa Chow, a graduate of John F. Kennedy High School in Plainview, is the daughter of Reuben Chow, staff scientist in the Corporate Research Center, Bethpage. Her Grumman advisor is Arthur Rubel, Fluid Mechanics Research, Theoretical Aerodynamics, Building 35, Bethpage.

Melissa will major in applied mathematics at SUNY-Binghamton. Ranked number one in her graduating class, Melissa is a member of the National Honor Society.

Reuben Chow says his daughter has always "strived for the top. She has always been highly motivated and throughout school, math has been her forte."

Melissa participated in math olympiads, student government and was layout editor for the school newspaper. She was also a volunteer with the school's Project Outreach program, which assists in community activities.

Laura Cordani is the daughter of Adelchi Cordani, manager of Computer-Aided Engineering, Space Advanced Technology in Building 25, Bethpage. Her Grumman advisor is Joan Tebo-Sabatino, Structural Design, also Building 25.

Laura graduated with honors from Half Hollow Hills High School East. Both she and twin sister Anita will study mechanical engineering at Columbia University. Their father is also a mechanical engineer, and has a master's degree in computer science.

"I've always been interested in what my father does, and he encouraged me to go into engineering," Laura says. "He took me on a tour of Grumman three years ago when he was working on the F-14 fatigue test program.

"And anyway, I've been reading *Mechanical Engineering* magazine for years," Laura says.

(Continued on page 6)

Adm. Ramsey Tells '86 Scholars: Engineering Is Grumman's Hallmark

"The road ahead is not well marked. Take each step as well as you can and you will achieve the high ground," Vice Admiral William Ramsey, deputy commander of the U.S. Space Command, told the 16 members of the Class of '86.

Ramsey was guest speaker at the June 6 luncheon honoring the 1986 Grumman Science and Engineering Scholars. The luncheon was held at the Milleridge Cottage, Jericho, L.I. Also in attendance were the students' parents, guidance counselors, school principals, and Grumman advisors.

Grumman President George Skurla and Executive Vice President John O'Brien, who will succeed Skurla in August, presented awards to the scholars.

The vice admiral, who is stationed at Peterson Air Force Base, Colorado, said Grumman's engineering "firsts" have been crucial to the Navy's mission. Among these were the first all-metal aircraft delivered to the Navy, the FF-1; and the long line of Grumman fighters.

"Engineering is the hallmark of Grumman," Ramsey said. "In an industry where keen and innovative engineering is fundamental, Grumman's leadership is legend within the Navy and recognized internationally."

Ramsey also talked about the scientific programs of the near future: the Strategic Defense Initiative, the future Advanced Tactical Fighter, and the Space Station.

"We're banking that you'll continue your studies, that you will indeed achieve your academic goals, and that this investment will pay high dividends — for you and for our country," said Ramsey.

"Congratulations. You are the best of the best," said Grumman President George Skurla. "You have come through a very difficult screening process to be in the winners' circle."

Skurla pointed out that Roy Grumman was a scholarship student at Cornell University. In addition to his engineering talent, "he was a great humanitarian who cared for people and for the community," Skurla said.

Skurla said Roy Grumman had two goals in mind when he began the scholarship program. First, he wanted to make a contribution to the Long Island community. Second, he sought born-and-bred Long Islanders to work for his new company and sustain it in the years ahead.

"The programs that we have today have been created and conceived by the ingenious minds of our engineers," Skurla said. He noted that technical excellence wins contracts for Grumman — resulting in job security for employees and a strong local economy.

"You young people are at the sunrise of your careers, while I'm at the sunset of mine," he added. "As much as we've accomplished in the past, your opportunities in the years ahead are tremendous."

A Big Welcome. *Lara Berkoski is congratulated by Grumman President George Skurla and Executive Vice President John O'Brien at the recent scholarship luncheon. Also pictured are (L to R) Vice Adm. William Ramsey, deputy commander of the U.S. Space Command; Paul Sluiter, Scholarship Program administrator; and Vice President Jack Carroll.*

Introducing The Class Of '86

(Continued from page 5)

Laura was a member of the Future Business Leaders of America and the yearbook staff. She has worked with mentally and physically handicapped adults at the Suffolk Developmental Center.

Laura and her father, Adelchi Cordani

Jeffrey Dinkel, of Ward-Melville High School in Setauket, is the son of Dan Dinkel, group head of Performance Propulsion Flight Test in Calverton, Long Island. His Grumman advisor is Vincent Baglio, Flight Controls Integration, Building 35.

Jeffrey will major in aeronautical engineering at Duke University. He has wanted to work with

Jeffrey and his father, James Dinkel

airplanes for a long time — "at least since I was about 10," he says.

The scholar's father says, "Jeffrey picked up bits and pieces over the years about engineering. I'm very proud of him — he puts his all into everything he does."

Jeffrey was a member of the National Honor Society and received a National Merit Scholarship.

Robert Misita Jr. is the son of Robert Misita, senior research engineer in the Corporate Research Center. The East Islip High School grad will study electrical engineering at the University of Rochester. His Grumman advisor is Karin Watkins of Electronics Design in the Engineering Development Center, Bethpage.

Robert Sr. says his son has had his sights set on engineering for a long time. As a child, Robert Jr. was happiest when playing with tran-

Robert Jr. and his father, Robert Misita Sr.

sistor kits and model rockets and tinkering in his father's workshop.

When Robert was 14, he told his teachers he wanted to be an electrical engineer like his father. "It was my father's positive attitude about engineering that led me to make my decision," Robert explains. "In today's technological society, engineers help solve the problems and make for a better tomorrow. I admire that."

Robert was one of the top 43 in New York on the National Engineering Aptitude Test. He was a member of Students Against Driving Drunk and its student liaison committee.

These are the other 1986 Grumman scholarship winners.

Lara Berkoski, a Rocky Point Jr.-Sr. High School graduate, plans to attend Duke University as a mechanical engineering major. Her Grumman advisor is Kevin Frauenberger, Mechanical Design, Vehicle Engineering, Building 12, Bethpage.

Ranked fifth in her class, Lara was president of the National Honor Society in her senior year and placed second in the Suffolk County Mathletes competition in her junior year.

Mark daSilva, a graduate of Longwood High School, plans to study electrical engineering at Rensselaer Polytechnic Institute. His Grumman advisor is Frank Nolan, Technology & Development, Building 35.

Mark won three gold medals at the first Suffolk County Academic Decathlon. He was on the yearbook staff and a member of his school's Interscholastic Math team. He volunteers his free time at St. Charles Hospital and collects stamps as a hobby.

Charles Dlhopolsky, a Holy Trinity High School graduate, will study computer engineering at Rensselaer Polytechnic Institute. His advisor is William Vojir, Avionics Design, Building 35.

Although Charles isn't a Grumman dependent, his oldest brother, Joe, is a human factors engineer on the A-6F program in Calverton. The youngest of 13 children, Charles was ranked second in his graduating class. He was a member of four math clubs, and editor of the yearbook.

Scott Loetman, a Mepham High School June graduate, will major in computer science at Georgia Institute of Technology. His advisor is Tom Vollaro, Computer Technology, Woodbury.

Scott was president of the Varsity Math team, a member of the National Honor Society, and participated in the New York State Science Olympiad.

Gregory Vilardi, valedictorian for the Class of '86 at East Meadow High School, will study electrical engineering at Rensselaer Polytechnic Institute. His Grumman advisor is Max Wertheim, Armament Optics, Electromechanics, Building 5.

Gregory received the Rensselaer Medal for scientific and mathematics excellence and was president of the computer club. He was also a member of the National Honor Society.

Olentha Von Redden, a Freeport High School graduate, plans to study physics at Harvard University. His Grumman advisor is Alan Van Weele, Structural Test, Building 5.

A six-time gold medal winner in the Nassau County Interscholastic Math League, he was a member of the math team and the tutoring committee, and was yearbook co-editor.

The alternates are:

Thomas Costello, a Saint Anthony's High School graduate, will study chemical engineering at Manhattan College.

He is the son of Vincent Costello, group leader, EA-6B Operations Support. His Grumman advisor is Fortunata Altmayer, Software Systems, Building 35.

A National Honor Society student, Thomas received the General Excellence Math award.

Craig Devoe, a Hauppauge High School graduate, plans to study physics at Cornell University. He is the son of George Devoe, staff engineer, Simulation, in the Engineering Development Center. His advisor is Ivan Kadar, Knowledge-Based Artificial Intelligence Technology, Building 35.

A National Honor Society student, Craig has received the Simons Fellowship (Physics) at SUNY-Stony Brook.

Susan Rand, an East Northport High School graduate, will major in electrical engineering at Cornell University. Her Grumman advisor is Barbara Gilmartin, Attack Systems Design & Analysis, Engineering Development Center.

Susan, a non-dependent alternate scholar, placed second in the Suffolk County Math Contest in 1984. She was a member of the National Honor Society.

Lisa Sobierajski, a Comsewogue High School graduate, is the daughter of F-14 Systems Project Engineer Joseph Sobierajski. She will major in physics and computer science at SUNY-Stony Brook. Her advisor is Richard DeIasi, Materials & Structural Mechanics, Building 35.

Ranked second in her class, Lisa was a member of the National Honor Society and National French Honor Society.

B. D. Abel

L. H. Bauer

D. G. Chalich

P. D. Clanton

H. P. Clark

E. G. Duane

H. Huttenlocher Jr.

D. J. Komlosy

V. R. LaRocca

S. Mirchin

A. B. Pifko

J. A. Pusateri

M. Rimer

P. J. Sciarratta

J. T. Sobierajski

R. R. Strollo

Service Milestones

45

Frank S. Sadowski, Tanks & Ducts, Bethpage, Aircraft

40

John C. Ohler, V. P. Marketing, Bethpage, Allied

35

John K. Benz, Avion. Des. Mgmt., Bethpage, Aircraft
James L. Boyle, Elect. Sub. Assembly, Stuart, Aircraft
John C. Czugh, M&ME Mgmt., Bethpage, Aircraft
John M. Dukarm, Bldg. 14/26 Inst. Mgmt., Bethpage, Aircraft
Hans K. Hinz, Systems Sci., Bethpage, Aircraft
Carl O. Lofgren, Pwr. Plt. Des., Bethpage, Aircraft
William L. McDermott, Corp. Sec., Bethpage, Services
Alfred Neuman, Jigs & Fixtures, Bethpage, Aircraft
Joseph F. Oliveri, Corp. Sec., Bethpage, Services
Saverio Orella, Proj. Mgmt., Melville, Aircraft
Henry J. Powers, Pwr. Plt. Des., Bethpage, Aircraft
Eugene M. Reardon, Pres. Svcs., Bethpage, Services
John W. Sabisch, Prod. Cont.-Parts Cont., Bethpage, Aircraft
Nicholas S. Sinder, Dept. Ops. Mgmt., Bethpage, Aircraft
John S. Townson, Central Ship.-Cont. & Pkg., Bethpage, Aircraft
Raymond E. Weick, Prod. Mgmt., Calverton, Aircraft
Kenneth Wendell, Elect.-Mech. Line, Bethpage, Aircraft
Joseph A. Whelan Sr., Reqts. Plann., Bethpage, Aircraft

30

Jesse Combs Jr., Ctr. Sect. Maj.& Subs, Bethpage, Aircraft
Edward A. Beacom, Mech. Process Eng., Bethpage, Aircraft
Michael F. Kelly, Trans. Office, Bethpage, Aircraft
Charles E. Heeger, N.C. Router, Bethpage, Aircraft
Paul A. Hentschel, Mach. Oper.-Tech. Serv., Bethpage, Aircraft
John J. Knespler, Mach. Ops., Bethpage, Aircraft
Raymond R. Russo, Prod. Mgmt., Calverton, Aircraft
Ronald R. Chamberlin, ILS Tech. Writing, Bethpage, Aircraft

D. B. Sullivan

G. F. Tomlinson Jr.

S. D. Torregrossa

E. C. Walch

Stephen G. Norton, Prog. Eng. Mgr., Bethpage, Aircraft
Richard H. Marshall, Adv. Space, Bethpage, Space
Charles E. Lane Audit Lia., Bethpage, Aircraft
Alan C. Mills, Source Insp./Test, Bethpage, Aircraft
John J. Leoniak, Landing Gear, Bethpage, Aircraft
Herbert Watman, Aero. Staff, Bethpage, Aircraft
Ernest R. Ranalli, Struct. Sci. Mgmt., Bethpage, Aircraft
Russell H. Hagerman, Des. Eng. Mgmt., Bethpage, Aircraft
Barrett Whitman Jr., Veh. Struct. Analysis, Calif., Aircraft
Robert B. Nurnberger, Stability & Cont., Melville, Aircraft
Roy G. Kandler, Special Proj., Great River, Electronics
Francis Schleider, Prog. Mgmt., Great River, Electronics
Robert H. Lemke, ILS Mech. Eng. Mgmt., Calif., Aircraft
William L. Kelley, Personnel Mgmt., Bethpage, Services
Ronald W. Anders, Personnel Mgmt., Bethpage, Services
Robert Welsch, Fld. Service, Houston, Electronics

25

Bruce D. Abel, Pwr. Plt. Des., Bethpage, Aircraft
Lawrence H. Bauer, Prod. Dev. Center, Bethpage, Aircraft
Daniel G. Chalich, Assembly Methods, Bethpage, Aircraft
Paul D. Clanton, Radar, Melville, Melbourne
Harold P. Clark, Supt. Equip. Prod., Bethpage, Aircraft
Evan G. Duane, Eng. Dev. Mgmt., Bethpage, Aircraft
Henry J. Huttenlocher Jr., Nav. & Cont. Equip. Des., Bethpage, Aircraft
David J. Komlosy, ILS Subsystem Eng., Melville, Aircraft
Vito R. LaRocca, Meas. Std. Calverton, Aircraft
Seymour Mirchin, IBM Bus Ops, Bethpage, Data
Allen B. Pifko, Matl. & Struct. Mech., Bethpage, Aircraft
Joseph A. Pusateri, Des. Eng. Proj. Mgmt., Melville, Aircraft
Melvyn Rimer, Stability & Cont./Fly Qual., Bethpage, Aircraft
Pasquale J. Sciarratta, ILS Tech. Writing, Bethpage, Aircraft
Joseph T. Sobierajski, Sys. Dev. & Integ. Proj. Mgmt, Bethpage, Aircraft
Richard R. Strollo, Training Mgr., Bethpage, Aircraft
David B. Sullivan, Mrkt. Plann./Ops. Analysis, Bethpage, Aircraft
George F. Tomlinson Jr., V.P.-Aircraft Services, Technical Services, Bethpage
Salvatore D. Torregrossa, Tech. Supt. Eng., Bethpage, Aircraft
Edward C. Walch, Instruct./Analysis, Bethpage, Aircraft

Final Touches. *In Bethpage's Building 4, Jesse Clark (standing), Dan Jagiello, and Art Foley do some last minute inspection and maintenance of a Grumman C-2A Greyhound. Upon delivery to the Navy, this aircraft will ferry supplies to aircraft carriers at sea. (Photo by Bob Settles)*

Obituaries

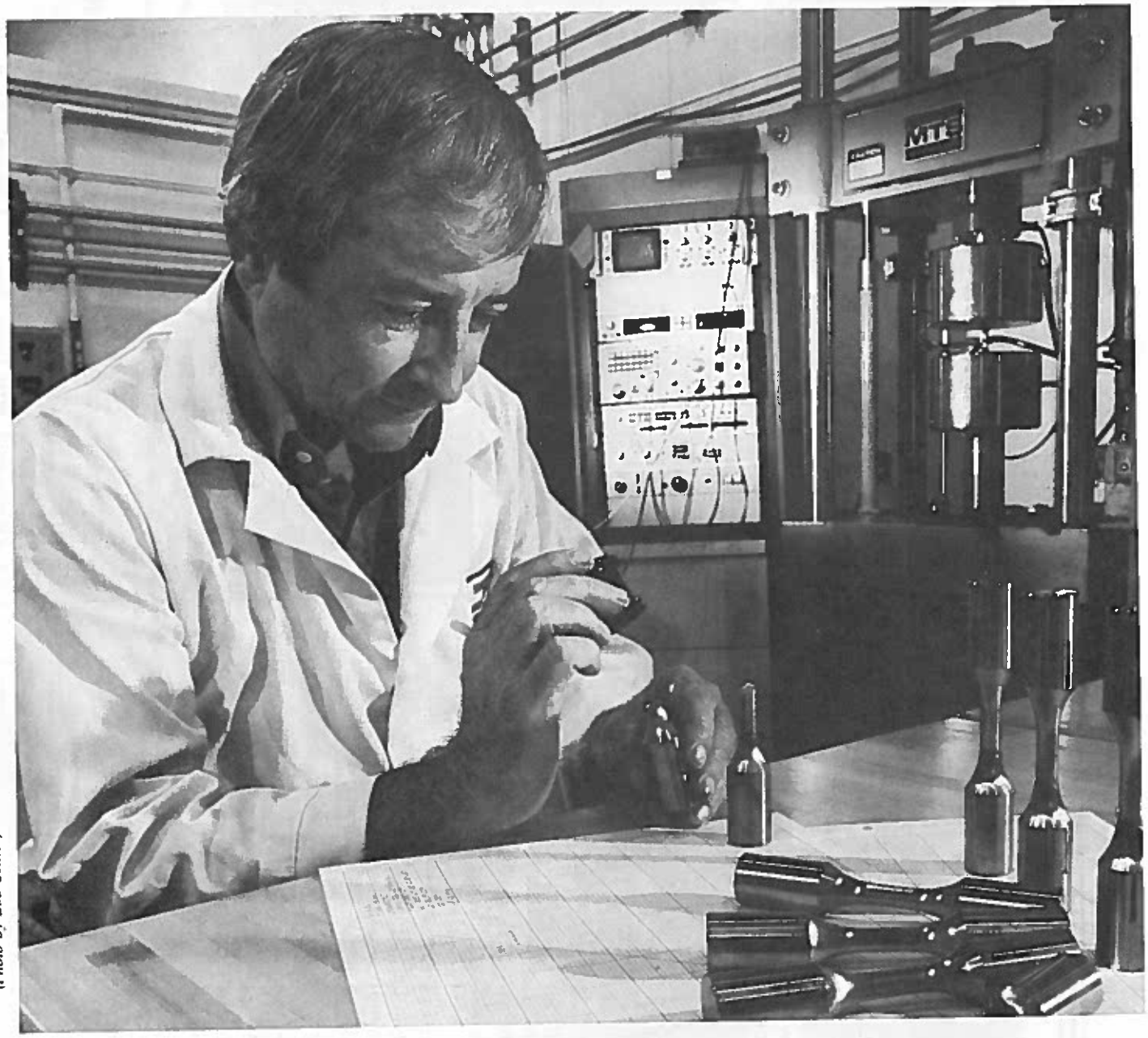
Ivan J. Deane of Power Plant Design, Bethpage, Aircraft Systems, died May 11 at the age of 62. He had been with the company since 1963 and resided at 76 Forest Row, Great Neck, N.Y.

Richard H. Imgram of Avionics Design Management, Bethpage, Aircraft Systems, died May 27 at the age of 59. He had been with the company since 1951 and resided at 59 Maplewood Dr., Plainview, N.Y.

Art T. Kuykendall of ILS Site Requirements, Bohemia, Aircraft Systems, died May 17 at the age of 42. He had been with company since 1985 and resided at 1 Fairlawn Dr., Deer Park, N.Y.

George H. Lake Jr. of Environmental Control and Test, Bethpage, Aircraft Systems, died May 22 at the age of 57. He had been with the company since 1952 and resided at 284 S. Lake Ave., Nesconset, N.Y.

GrummanWorld
June 27, 1986



(Photo by Bob Settles)

A Test Of Strength

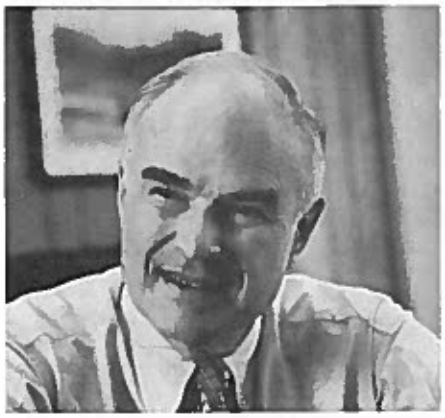
When engineer Paul Power looks for a break he isn't concerned with coffee.

At work in the Structures Research Lab in Bldg. 26, Bethpage, he's investigating the crack in a piece of titanium with magnifying glass. Power needs to know exactly where the break began.

In order to study the strength of special alloys and composites, such as the titanium samples on his desk, he puts the test articles into the Materials Test System (MTS) console in the background. The MTS allows him to measure just how much stress the material can take until it breaks.

These particular samples of titanium are the same metal being used in the Lavi fighter. Grumman is building the wings and vertical tail assemblies.

A Letter From The Chairman



The President's commission has completed its investigation of the Challenger tragedy and made its recommendations.

The commission's investigation revealed that NASA and its contractors had management problems, communications failures, flaws in judgment and decision making. It called for the complete overhaul of the space program. Perhaps our nation's faith in technology will never again be as unshakeable as it was before January 28, and perhaps that is a blessing.

People who work in high tech companies, as Grummanites do, have viewed the proceedings with special concern. Grummanites were involved in the lunar landings. We built the wings for the Shuttle, and we are part of the launch team at Cape Kennedy. We have been in the business of defying gravity for the past 56 years, and we know that it takes faith, guts, and painstaking attention to detail to make good flying machines. We feel great sympathy for the families of Challenger's seven astronauts; we also know the anguish felt by the people in NASA and the contractor companies.

The sorrow and disappointment our country feels right now, a real blow to our national confidence, make it difficult to see the reasons for going back into space.

However well intentioned, the current rhetoric tends to be beside the point. Some say we should abandon this expensive program, and others invoke the memories of the Challenger heroes and say they should not have died in vain. Maintaining our position as the most technologically advanced country in the world is offered as a reason to continue, but even that falls a little flat.

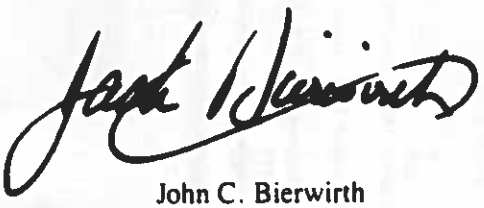
As reported in the New York Times on June 17, the new edition of Jane's Spaceflight Directory says the American space program is now 10 years behind that of the Soviet Union. Jane's, a respected British publisher of military and transportation reference books, notes that the Soviets will soon have 10 different types of expendable launch vehicles plus two reusable manned vehicles. "The Soviets are so far ahead of the U.S. in space experience that they are almost out of sight," says Jane's.

Soviet policies make their presence there a threat, but we don't go into space just to match or best the Soviets. National security and pride are part of the reason, of course, but they're not all of it.

There's also more to it than the practical utilization of space. I don't believe that we journey into space to make perfectly round ball bearings or new pharmaceuticals.

We journey into space because we can: because we have the talent, the ability, and the vision to do so. People have always needed to explore the unknown. When Christopher Columbus promised Ferdinand and Isabella that he'd bring back spices, he was trying to justify the trip. But the intensity that he felt in his soul came from a desire to open up the world.

Future generations will look back at what we have done with our opportunities. History books must not show that in 1986 we lost heart; that we gave up on our dreams. They must show that we learned from our mistakes, and then reached out to where the sky goes on forever.



John C. Bierwirth
Chairman

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